

Amendments To The Claims:

Please amend the claims as shown.

1 – 10 (canceled)

11. (new) A method for monitoring a fast-switching pulse charging valve of an internal combustion engine, comprising:

determining a reference induction pipe pressure profile of an induction pipe of the internal combustion engine, the reference induction pipe pressure profile indicative of an operating state of a pulse charging valve arranged in the induction pipe;

detecting an actual induction pipe pressure profile associated with the induction pipe by pressure sensor;

comparing the actual induction pipe pressure profile with the reference induction pipe pressure profile; and

verifying the pulse charging valve is functioning based on the comparison.

12. (new) The method according to claim 11, wherein the operating state of the pulse charging valve is an open position, a closed position or a freely oscillating middle position.

13. (new) The method according to claim 12, wherein the actual induction pipe pressure profile is compared with a reference induction pipe pressure over a cylinder segment of the internal combustion engine.

14. (new) The method according to claim 13, wherein a frequency spectra of the actual induction pipe pressure profile and the reference induction pipe pressure profile are compared to determine the functioning of the pulse charging valve.

15. (new) The method according to claim 14, wherein the frequency spectra of the actual and reference pressure profiles are filtered to provide frequency elements and the frequency elements are compared to determine the proper functioning of the pulse charging valve.

16. (new) The method according to claim 15, wherein an actual natural oscillation frequency of the pulse charging valve is compared with an expected natural oscillation frequency of the pulse charging valve that is determined for an operating state of the pulse charging valve.

17. (new) The method according to claim 16, wherein the operating state of the pulse charging valve is in the freely oscillating middle position.

18. (new) The method according to claim 15, wherein the amplitudes of the frequency spectra of the pressure profiles are compared.

19. (new) The method according to claim 18, wherein the comparison is made as a function of a quadratic deviation of the amplitudes of the frequency spectra.

20. (new) The method according to claim 19, wherein the comparison is made as a function of the rotational speed of the internal combustion engine crankshaft.

21. (new) A device for monitoring a fast-switching pulse charging valve of an internal combustion engine, comprising:

an induction pipe pressure sensor that measures an actual induction pipe pressure profile of an induction pipe of the engine;

a comparator that compares the actual induction pipe pressure profile with a reference induction pipe pressure profile, the reference induction pipe pressure profile representing an induction pipe pressure profile associated with a functioning pulse charging valve; and

a verifier that verifies the functioning of the pulse charging valve based on the comparison of the actual and reference pressure profiles.

22. (new) The device according to claim 21, wherein a frequency spectra of the actual induction pipe pressure profile and the reference induction pipe pressure profile are compared to determine the functioning of the pulse charging valve.

23. (new) The device according to claim 22, wherein the frequency spectra of the actual and reference pressure profiles are filtered to provide frequency elements and the frequency elements are compared to determine the proper functioning of the pulse charging valve.

24. (new) The device according to claim 23, wherein an actual natural oscillation frequency of the pulse charging valve is compared with an expected natural oscillation frequency of the pulse charging valve that is determined for an operating state of the pulse charging valve.

25. (new) An internal combustion engine, comprising:

- an intake manifold;
- an induction pipe connecting the intake manifold to an intake of a cylinder of the internal combustion engine;
- a gas intake valve located at the intake of the internal combustion engine cylinder;
- a fast-switching pulse charging valve arranged in the induction pipe that seals the induction pipe as a function of a selected position wherein the pulse charging valve is configured as a spring-mass oscillator, comprising two electromagnets located at a distance from each other, with a coil core and armature respectively, and the position of the valve is a function of a control current through the coils;
- an induction pipe pressure sensor located in the induction pipe that detects an actual induction pipe pressure; and
- a comparator that:
 - compares the actual induction pipe pressure profile with a reference induction pipe pressure profile wherein the a reference induction pipe pressure profile represents a properly functioning pulse charging valve, and
 - identifies the proper functioning of the pulse charging valve based on the comparison of the actual and reference pressure profiles.

26. (new) The internal combustion engine according to claim 25, wherein a frequency spectra of the actual induction pipe pressure profile and the reference induction pipe pressure profile are compared to determine the functioning of the pulse charging valve.

27. (new) The internal combustion engine according to claim 26, wherein the frequency spectra of the actual and reference pressure profiles are filtered to provide frequency elements and the frequency elements are compared to determine the proper functioning of the pulse charging valve.

28. (new) The internal combustion engine according to claim 27, wherein an actual natural oscillation frequency of the pulse charging valve is compared with an expected natural oscillation frequency of the pulse charging valve that is determined for an operating state of the pulse charging valve.

29. (new) The internal combustion engine according to claim 28, wherein the amplitudes of the frequency spectra of the pressure profiles are compared.

30. (new) The internal combustion engine according to claim 29, wherein the comparison is made as a function of a quadratic deviation of the amplitudes of the frequency spectra.